

Claims

We claim:

1. A method of transferring a set of data over a network, the method

comprising:

5 monitoring the level of actual network bandwidth utilization;

identifying a maximum monitored level of actual utilization;

calculating a threshold level of utilization as a function of the maximum monitored
level of utilization; and

if the actual level is less than the threshold level, receiving at least a portion of the

10 set of data over the network.

2. The method of claim 1, wherein a client receives the data over the network

from a server.

15 3. The method of claim 2, wherein said monitoring occurs at the interface

between the client and the network.

4. The method of claim 1, wherein the network is the Internet.

20

5. The method of claim 1, wherein the threshold level is equal to a

predetermined percentage of the maximum monitored level.

6. The method of claim 1, wherein the set of data includes a software update.

7. The method of claim 1, further comprising repeating at least said monitoring step each time a portion of the set of data is received.

5 8. The method of claim 7, wherein said receiving step includes separately receiving a plurality of discrete portions of the set of data over the network when the actual level is less than the threshold level.

10 9. The method of claim 8, further comprising incrementing a counter each time a discrete portion of the data is received over the network.

10. The method of claim 9, wherein the size of the discrete portions of the data is a function of the value of the counter.

11. The method of claim 10, further comprising increasing the size of the discrete portions of the data when the value of the counter is greater than a predetermined value.

12. The method of claim 9, further comprising clearing the counter after receiving all of the plurality of discrete portions of the data over the network.

20

13. The method of claim 9, further comprising clearing the counter if the level of actual utilization becomes greater than the threshold level.

14. The method of claim 8, further comprising suspending the receipt of discrete portions of the data if the level of actual utilization becomes greater than the threshold level.

15. The method of claim 14, further comprising resuming the receipt of discrete portions of the data from the point of suspension when the level of actual utilization becomes less than the threshold level.

16. The method of claim 1, further comprising:
repeating said monitoring step each time a portion of the set of data is received;
identifying a maximum level of utilization during receipt of the set of data; and
calculating a threshold level of utilization for the set of data as a function of the maximum level of utilization identified during receipt of the set of data.

17. The method of claim 16, wherein said identifying step includes estimating the maximum level of utilization during receipt of the set of data by calculating an average level of utilization for the set of data upon repeating said monitoring step a predetermined number of times during receipt of the set of data.

18. The method of claim 16, further comprising receiving at least a portion of the set of data over the network if the actual level is less than the threshold level for the set of data.

19. The method of claim 16, further comprising receiving at least a portion of a second set of data over the network if the actual level is less than the threshold level for the set of data.

5 Sub A 20 A computer-readable medium having computer-executable instructions for performing the steps recited in claim 1.

10 21. A computer system having a memory, an operating system and a central processor, said processor being operable to execute the instructions stored on the computer-readable medium of claim 20.

15 22. A computer-readable medium having stored thereon a data structure, comprising:

20 a first data field containing data representing a maximum monitored level of actual network bandwidth utilization; and

25 a second data field containing data representing a threshold level of network bandwidth utilization below which data may be transferred over the network without interfering with other network activity, wherein said second data field is derived from said first data field by calculating the threshold level as a function of the maximum monitored level.

20

23. The computer-readable medium of claim 22, wherein the threshold level is calculated as a predetermined percentage of the maximum monitored level.

24. The computer-readable medium of claim 22, wherein the actual network bandwidth utilization is monitored at an interface between a client machine and the network.

25. A computer-readable medium having computer-executable components for managing the transfer of data over a network, comprising:

a bandwidth monitoring component which monitors the level of actual bandwidth utilization for a network connection and identifies a maximum monitored level of utilization;

a threshold calculating component which calculates a threshold level of utilization as a function of the maximum monitored level of utilization identified by said bandwidth monitoring

10 component; and

a transfer management component which manages the transfer of data over the network when the level of actual bandwidth utilization is less than the threshold level of utilization.

15 26. The computer-readable medium of claim 25, wherein the network connection is an interface between a client machine and the network.

27. The computer-readable medium of claim 25, wherein the threshold level is calculated as a predetermined percentage of the maximum monitored level.

20 Sub A 28. A method of communicating between a client process and a server process over a network, the method comprising:

(a) issuing to the server process a first download request which identifies a file and which requests that the server process download a first segment of the file over the network;

Sub A²⁷

- (b) downloading, by the server process, the first segment of the file;
- (c) issuing to the server process a further download request which is associated with the file and which requests that the server process download a further segment of the file over the network, provided the actual network bandwidth utilization is less than a threshold level;
- 5 (d) downloading, by the server process, the further segment of the file; and
- (e) repeating steps (c) and (d) until the server process has downloaded each segment of the file over the network.

Add C²⁷

09505255-022600